Goddard Space Flight Center 2009 Sample Student Projects

Required Academic Level

Freshman/Sophomore
Undergraduate, Junior/Senior
Undergraduate

Category

Computer & Info. Sci

Subcategory

Computer Science

Project Title

Phase Retrieval Algorithms for Desktop Graphics Cards

Project Description

Modern graphic cards are designed for performing computational tasks to render and display graphics. As an alternative application, this architecture can provide a significant improvement in performance for mathematical operations over the traditional general-purpose processor. Image-based phase retrieval provides many advantages over conventional optical-based phase recovery approaches in accuracy and optical simplicity, yet a current limitation is computational run-time performance in a cross-platform and development environment. The student will implement the tools and components of phase retrieval on currently-off-the-shelf graphics cards to circumvent this limitation.

Mentor's Expectation of Student

We expect our summer student to be involved in the implementation and development of phase retrieval algorithms for desktop graphic cards. The student must be proficient in Matlab, C/C++, and the Mac OS X operating system.

Discipline of Project and/or Background Needed to successfuly complete the project

Computer Hardware; Image Processing; Computer Science; Engnr: Electrical & Optical

Skills

Listening/Note Taking, Oral/Presentation, Analysis, Problem Solving, Research, Teamwork, Time Management, Data Acquisition, Optics, Embedded Systems/Microcontrollers, FPGA, Linux/Unix, Macintosh, Windows, Excel, Word, Powerpoint, C, C++, IDL